

REMARKS

At the time of the Office Action dated March 25, 2010, claims 1, 3, 4, 6, 10-13, 15, 16, 21 and 22 were pending in this application. In this Amendment, claim 1 has been amended, and claims 11, 13, 15, 16, 21, and 22 canceled, without prejudice, reserving right to prosecution in a continuation/divisional application. Care has been exercised to avoid the introduction of new matter. Support for the amendments to the claims can be found in, for example, the paragraph bridging pages 22 and 23 of the specification.

Claims 1, 3, 4, 6, 10, and 12 are now active in this application, of which claim 1 is independent.

Claim Rejection Under 35 U.S.C. § 103

1. Claims 1, 3, 4, 6, 10, 11, 13, 15, 16, and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata et al. (U.S. Patent Application Publication No. 2001/0008295, hereinafter "Sakata") in view of Kloppel et al. (U.S. Patent Application Publication No. 2003/0170449, hereinafter "Kloppel"), Kataoka et al. (U.S. Patent No. 6,133,522, hereinafter "Kataoka") and Yamazaki (U.S. Patent No. 4,746,962, hereinafter "Yamazaki") and further in view of Minoru et al. (JP 2002-305212, hereinafter "Minoru").

It is noted that the rejections of claims 11, 13, 15, 16, and 21 has been rendered moot by the cancellation of the claims.

Sakata, Kloppel, Kataoka, Yamazaki, and Minoru, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1. Specifically, the applied combination of the references does not teach, among other things, that "said transparent conductive oxide film whose content of Sn is not more than 5 percent by weight has an arithmetic mean deviation of the profile (Ra) of at least about 0.5 nm and not more than 2 nm, and has a surface with respect to which a contact angle of water is at least about 40° and not more than about 74°," recited in claim 1.

Claim 1 now recites the limitations of cancelled claim 11. With respect to claim 11, the Examiner asserted that “[w]hile not explicitly disclosed [in Kloppel], ‘the contact angle of water on the surface of the ITO film is at least about 40° and not more than about 74°’ is an inherent property when the arithmetic mean deviation of the profile (Ra) of the ITO film is in the range of at least 0.5 nm to not more than about 2 nm (see Applicant’s specification, page 35 line 23 – Page 36 line 8 and Figure 8)” (the paragraph bridging pages 4 and 5 of the Office Action).

Applicants respectfully disagree. As claimed, the limitations “a surface with respect to which a contact angle of water is at least about 40° and not more than about 74°” can be obtained at least when (1) an Sn content of the transparent conductive oxide film is not more than 5 percent by weight and (2) the transparent conductive oxide film has an arithmetic mean deviation of the profile (Ra) of at least about 0.5 nm and not more than 2 nm.

According to the Examiner, Yamazaki teaches that “a content of SnO₂ (tin oxide) in a transparent conductive oxide electrode of a solar cell is about 1-10 wt% (See col. 6 lines 21-24, or col. 9 lines 33-34), or the Sn (e.g., tin) content is about 0.788-7.88 wt%” (the third full paragraph on page 4 of the Office Action). Kloppel teaches that “the transparent conductive oxide film of ITO having an arithmetic mean deviation of the profile (or surface roughness) of less than 1 nm (See paragraph [0013])” (the paragraph bridging pages 4 and 5 of the Office Action). Even if it is assumed for the sake of this response that the Examiner’s assertions for these references are proper, Yamazaki and Kloppel do not indicate a contact angle of water with respect to a surface of a transparent conductive oxide film in relation to the Sn content and the arithmetic mean deviation, respectively.

Applicants emphasize that merely identifying a part of limitations of the claim in disparate prior art references does not automatically establish that the remainder of the limitations is inherent.

The Examiner's inherent arguments with respect to the claimed contact angle of water is improper, and does not cure the deficiencies of the applied combination of the references.

Based on the foregoing, Sakata, Kloppel, Kataoka, Yamazaki, and Minoru, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1. Dependent claims 3, 4, 6, and 10 are also patentably distinguishable over Sakata, Kloppel, Kataoka, Yamazaki, and Minoru at least because these claims respectively include all the limitations recited in independent claim 1. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

2. Claims 12 and 22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata in view of Kloppel, Kataoka, Yamazaki, and Minoru, and further in view of Morizane et al. (U.S. Patent Application Publication No. 2001/0045505, hereinafter "Morizane").

The rejection of claim 22 has been rendered moot by the cancellation of the claim.

Claim 12 depends on independent claim 1. Applicants thus incorporate herein the arguments made in response to the rejection of independent claim 1 under 35 U.S.C. § 103 for obviousness as predicated upon Sakata, Kloppel, Kataoka, Yamazaki, and Minoru. The Examiner's additional comments and further reference to Morizane do not cure the deficiencies of the applied combination of Sakata, Kloppel, Kataoka, Yamazaki, and Minoru. Morizane does not address the above discussion regarding the claimed contact angle of water. Applicants, therefore, respectfully solicit withdrawal of the rejection of claim 12 and favorable consideration thereof.

3. Claims 1, 3, 4, 6, 10, 11, 13, 15, 16, and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata in view Kataoka, Yamazaki and Kawai et al. (JP 58-56479, hereinafter “Kawai”), and further in view of Minoru.

It is noted that the rejections of claims 11, 13, 15, 16, and 21 has been rendered moot by the cancellation of the claims.

Sakata, Kataoka, Yamazaki, Kawai, and Minoru, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1. Specifically, the applied combination of the references does not teach, among other things, that “said transparent conductive oxide film whose content of Sn is not more than 5 percent by weight has an arithmetic mean deviation of the profile (Ra) of at least about 0.5 nm and not more than 2 nm, and has a surface with respect to which a contact angle of water is at least about 40° and not more than about 74°,” recited in claim 1.

Claim 1 now recites the limitations of cancelled claim 11. The Examiner took the same approach to reject claim 11 based on the combination of Sakata, Kloppel, Kataoka, Yamazaki, and Minoru (see paragraph 1 of this response). The Examiner asserted that “[w]hile not explicitly disclosed [in Kawai], ‘the contact angle of water on the surface of the ITO film is at least about 40° and not more than about 74°’ is an inherent property of the material when the arithmetic mean deviation of the profile (Ra) of the ITO film is in the range of at least 0.5 nm to not more than about 2 nm (see Applicant’s specification, page 35 line 23 – Page 36 line 8 and Figure 8)” (the second full paragraph on page 10 of the Office Action).

Applicants respectfully disagree, and again submit that the limitations “a surface with respect to which a contact angle of water is at least about 40° and not more than about 74°” can be obtained at least when (1) an Sn content of the transparent conductive oxide film is not more

than 5 percent by weight and (2) the transparent conductive oxide film has an arithmetic mean deviation of the profile (Ra) of at least about 0.5 nm and not more than 2 nm.

According to the Examiner, Yamazaki teaches that “a content of SnO₂ (tin oxide) in a transparent conductive oxide electrode of a solar cell is about 1-10 wt% (See col. 6 lines 21-24, or col. 9 lines 33-34), or the Sn (e.g., tin) content is about 0.788-7.88 wt%” (the first full paragraph on page 10 of the Office Action). Kawai teaches that “the ITO can be polished to have a smooth surface roughness about 1nm (See English abstract, figures 7 and 8)” (the second full paragraph on page 10 of the Office Action). Even if it is assumed for the sake of this response that the Examiner’s assertions for these references are proper, Yamazaki and Kawai do not indicate a contact angle of water with respect to a surface of a transparent conductive oxide film in relation to the Sn content and the arithmetic mean deviation, respectively.

Applicants emphasize that merely identifying a part of limitations of the claim in **disparate** prior art references does **not automatically establish** that the remainder of the limitations is inherent.

The Examiner’s inherent arguments with respect to the claimed contact angle of water is improper, and does not cure the deficiencies of the applied combination of the references.

Based on the foregoing, Sakata, Kataoka, Yamazaki, Kawai, and Minoru, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1. Dependent claims 3, 4, 6, and 10 are also patentably distinguishable over Sakata, Kataoka, Yamazaki, Kawai, and Minoru at least because these claims respectively include all the limitations recited in independent claim 1. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

4. Claims 12 and 22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata in view of Kataoka, Yamazaki, Kawai, and Minoru, and further in view of Morizane.

The rejection of claim 22 has been rendered moot by the cancellation of the claim.

Claim 12 depends on independent claim 1. Applicants thus incorporate herein the arguments made in response to the rejection of independent claim 1 under 35 U.S.C. § 103 for obviousness as predicated upon Sakata, Kataoka, Yamazaki, Kawai, and Minoru. The Examiner's additional comments and further reference to Morizane do not cure the deficiencies of the applied combination of Sakata, Kataoka, Yamazaki, Kawai, and Minoru. Morizane does not address the above discussion regarding the claimed contact angle of water. Applicants, therefore, respectfully solicit withdrawal of the rejection of claim 12 and favorable consideration thereof.

5. Claims 1, 3, 4, 6, 10, 11, 13, 15, 16, and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata in view Huang et al. (U.S. Patent Application Publication No. 2004/0087252, hereinafter "Huang"), Kataoka, and Yamazaki, and further in view of Minoru.

It is noted that the rejections of claims 11, 13, 15, 16, and 21 has been rendered moot by the cancellation of the claims.

Sakata, Huang, Kataoka, Yamazaki, and Minoru, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1. Specifically, the applied combination of the references does not teach, among other things, that "said transparent conductive oxide film whose content of Sn is not more than 5 percent by weight has an arithmetic mean deviation of the profile (Ra) of at least about 0.5 nm and not more than 2 nm, and has a surface with respect to which a contact angle of water is at least about 40° and not more than about 74°," recited in claim 1.

Claim 1 now recites the limitations of cancelled claim 11. The Examiner took the same approach to reject claim 11 based on the combination of Sakata, Kloppel, Kataoka, Yamazaki, and Minoru (see paragraph 1 of this response). The Examiner asserted that “[w]hile not explicitly disclosed [in Huang], ‘the contact angle of water on the surface of the ITO film is at least about 40° and not more than about 74°’ is an inherent property of the material when the arithmetic mean deviation of the profile (Ra) of the ITO film is in the range of at least 0.5 nm to not more than about 2 nm (see Applicant’s specification, page 35 line 23 – Page 36 line 8 and Figure 8)” (the paragraph bridging pages 15 and 16 of the Office Action).

Applicants respectfully disagree, and again submit that the limitations “a surface with respect to which a contact angle of water is at least about 40° and not more than about 74°” can be obtained at least when (1) an Sn content of the transparent conductive oxide film is not more than 5 percent by weight and (2) the transparent conductive oxide film has an arithmetic mean deviation of the profile (Ra) of at least about 0.5 nm and not more than 2 nm.

According to the Examiner, Yamazaki teaches that “a content of SnO₂ (tin oxide) in a transparent conductive oxide electrode of a solar cell is about 1-10 wt% (See col. 6 lines 21-24, or col. 9 lines 33-34), or the Sn (e.g., tin) content is about 0.788-7.88 wt%” (the third full paragraph on page 15 of the Office Action). Huang teaches that “the transparent conductive oxide film of ITO can be polished to have a smooth surface with surface roughness of less than 1.5 nm (See paragraph 0018), and particularly 0.87 nm (see paragraph 0021)” (the paragraph bridging pages 15 and 16 of the Office Action). Even if it is assumed for the sake of this response that the Examiner’s assertions for these references are proper, Yamazaki and Huang do not indicate a contact angle of water with respect to a surface of a transparent conductive oxide film in relation to the Sn content and the arithmetic mean deviation, respectively.

Applicants emphasize that merely identifying a part of limitations of the claim in **disparate** prior art references does **not automatically establish** that the remainder of the limitations is inherent.

The Examiner's inherent arguments with respect to the claimed contact angle of water is improper, and does not cure the deficiencies of the applied combination of the references.

Based on the foregoing, Sakata, Huang, Kataoka, Yamazaki, and Minoru, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1. Dependent claims 3, 4, 6, and 10 are also patentably distinguishable over Sakata, Huang, Kataoka, Yamazaki, and Minoru at least because these claims respectively include all the limitations recited in independent claim 1. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

6. Claims 12 and 22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata in view of Huang, Kataoka, Yamazaki, and Minoru, and further in view of Morizane.

The rejection of claim 22 has been rendered moot by the cancellation of the claim.

Claim 12 depends on independent claim 1. Applicants thus incorporate herein the arguments made in response to the rejection of independent claim 1 under 35 U.S.C. § 103 for obviousness as predicated upon Sakata, Huang, Kataoka, Yamazaki, and Minoru. The Examiner's additional comments and further reference to Morizane do not cure the deficiencies of the applied combination of Sakata, Huang, Kataoka, Yamazaki, and Minoru. Morizane does not address the above discussion regarding the claimed contact angle of water. Applicants, therefore, respectfully solicit withdrawal of the rejection of claim 12 and favorable consideration thereof.

Conclusion

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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